Dakshit Agrawal

FINAL YEAR UNDERGRADUATE · COMPUTER SCIENCE

Indian Institute of Technology Roorkee

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Education

Indian Institute of Technology Roorkee | Undergraduate   *2016 - 2020 (Expected) | Roorkee, INDIA*

- Bachelor of Technology, Major in Computer Science, **CGPA: 9.371/10.00**

Bansal Public School | Senior School (Grade 11 & 12)   *2014 - 2016 | Kota, INDIA*

- **94%** in Grade 12 Board Examinations, conducted by Central Board of Secondary Education (CBSE), India

St. Johns Senior Secondary School | Secondary School (Grade 9 & 10)   *2012 - 2014 | Kota, INDIA*

- **CGPA: 10.0/10.0** in Grade 10 Board Examinations, conducted by Central Board of Secondary Education (CBSE), India

Research Experience

Carnegie Mellon University (CMU)   *Pittsburgh, USA*

RESEARCH INTERNSHIP | SN BOSE SCHOLARS PROGRAM | **PROF. KATERINA FRAGKIADAKI**   *May 2019 - Jul 2019*

- Worked on learning trainable sim2real 3D visual representations for robot control.
- Used a GPU-based simulator called Nvidia FleX which significantly lowered sampling time of replay buffers while training RL agents.
- [Report Link] [Presentation Link]

Indian Institute of Science (IISc)   *Bangalore, INDIA*

RESEARCH INTERNSHIP | **PROF. VENKATESH BABU RADHAKRISHNAN**   *Dec 2018 - Jan 2019*

- Proposed a top-down multi-generator model which uses a novel unsupervised hierarchical divisive strategy to model discontinuous multi-modal data. It was the first top-down approach which did not require prior definition of the number of generators.
- Incremental addition of new data modes to a trained GAN-Tree is possible by updating only a single branch of the tree structure.
- The work was accepted for publication in IEEE International Conference on Computer Vision 2019.
- [Paper Link] [Poster Link] [GitHub Link]

École de Technologie Supérieure (ÉTS)   *Montreal, CANADA*

REMOTE RESEARCH INTERNSHIP | **PROF. MARCO PEDERSOLI** | **PROF. JOSE DOLZ**   *May 2018 - Jul 2018*

- Developed an end-to-end model to learn scenic and facial features jointly using attention mechanisms for identifying the emotion portrayed by an image of a group of people.
- The model was submitted to ICMI 2018 EmotiW Group-Level Emotion Recognition Challenge and achieved **4th rank** among all participants. A short paper for the same was accepted for publication in ACM International Conference on Multimodal Interaction 2018.
- [Paper Link] [Presentation Link] [Poster Link] [GitHub Link]

Publications

GAN-Tree: An Incrementally Learned Hierarchical Generative Framework for Multi-Modal Data Distributions   *ICCV 2019*

JOGENDRA NATH KUNDU* | MAHARSHI GOR* | **DAKSHIT AGRAWAL** | R. VENKATESH BABU   *Paper Link*

In Proceedings of the IEEE International Conference on Computer Vision, pp. 8191-8200. 2019.

An Attention Model for Group-Level Emotion Recognition   *ICMI 2018*

AARUSH GUPTA* | **DAKSHIT AGRAWAL*** | HARDIK CHAUHAN | JOSE DOLZ | MARCO PEDERSOLI   *Paper Link*

In Proceedings of the 2018 on International Conference on Multimodal Interaction, pp. 611-615. ACM, 2018.

* denotes equal contribution

International Experience

IEEE International Conference on Computer Vision (ICCV) 2019   *Seoul, KOREA*

PRESENTING WORK IN CONFERENCE   *Oct 2019 - Nov 2019*

- Visited Korea to attend ICCV and present my work as a main conference poster to researchers around the globe.

Interaction with Multi-Disciplinary Scientists and Visionaries Involved in AI   *Tsukuba & Tokyo, JAPAN*
EXPLORING ARTIFICIAL INTELLIGENCE (AI) IN JAPAN   *Dec 2017*
- Visited Japan to interact with scientists and gain work culture exposure, with specific focus on the field of AI [**Report Link**].

Projects

Explainable Medical Diagnosis Using Deep Learning   *IIT Roorkee*
BACHELOR THESIS PROJECT | **PROF. MARCO PEDERSOLI** | **PROF. JOSE DOLZ** | **PROF. BALASUBRAMANIAN RAMAN**   *Aug 2019 - PRESENT*
- Developing a deep learning model to generate diagnostic medical reports with visually grounded evidence.
- Implemented three models from scratch to use as baselines. Their performance on IU-XRay dataset matched the respective papers.
- Developed an improved method for marking regions of the X-Ray conducive for generation of particular sentences in the diagnosis.
- [**Report Link**] [**Poster Link**]

Triplet-Loss VAE for Zero-Shot Learning   *IIT Roorkee*
UNDERGRADUATE RESEARCH PROJECT | **PROF. BIPLAB BANERJEE**   *Jan 2018 - Apr 2018*
- Developed a near state-of-the-art deep learning model for recognizing unknown human actions in videos using zero-shot learning.
- Made a custom VAE using triplet deep metric loss to map the visual and semantic features onto a joint latent embedding space.

Unsupervised Human Action Detection in Videos   *IIT Roorkee*
UNDERGRADUATE RESEARCH PROJECT | **PROF. BIPLAB BANERJEE**   *Aug 2017 - Jan 2018*
- Implemented Spectral Clustering, for unsupervised clustering of video frames constituting similar human actions.
- Used Gaussian Mixture Models and Conditional Random Fields to incorporate temporal features of the frames into the algorithm.

Achievements

2019   **Department Rank 3**: Ranked 3rd out of 76 students in the IIT Roorkee Computer Science batch of 2020.
2019   **SN Bose Scholar**: Awarded by **Indo-U.S. Science and Technology Forum (IUSSTF)** to nurture future innovators and thought leaders [**Link**].
2016   **All India Rank 352**: JEE Advanced, rank out of 200,000 candidates.
2014   **KVPY Fellow**: Highly prestigious National Fellowship awarded by **Indian Institute of Science** and **Govt. of INDIA** to students who show high aptitude in research [**Link**].
2012   **NTSE Scholar**: Awarded by **Govt. of INDIA** to students who show high intellect and academic talent [**Link**].

Teaching Experience

Speaker | Faculty Development Program   *Feb 2018 | IIT Roorkee*
- Gave a tutorial on Keras as a part of the Faculty Development Program organized by Electronics & ICT Academy [**Link**].

Instructor | Computer Camp   *Jun 2017, 2018 | Birgunj, NEPAL*
- Invited for two summers to instruct the computer camp held by GRADE Academy, Birgunj, NEPAL for students of Grade 1-5 on various topics of Computer Science.

Undergraduate Teaching Assistant (UG TA) | MAN-001   *Oct 2017 - Nov 2017 | IIT Roorkee*
- Worked as TA for course MAN-001, a Mathematics course on Matrices and Calculus for first year students of IIT Roorkee.

Teacher | NSS Prerna   *Jul 2016 - Apr 2017 | IIT Roorkee*
- One year of teaching experience as a Social Volunteer to students of Grade 4 - 10 in Maths and Science.

Extracurricular Activity

- Co-President | Vision and Language Group (VLG) [**Link**]

- Treasurer | ACM Student Chapter

- Mentor | Student Mentorship Program (SMP) [**Link**]

- Android Developer | Mobile Development Group (MDG) [**Link**]